Nova Scotia

Department of
FISHERIES

18th Annual Report

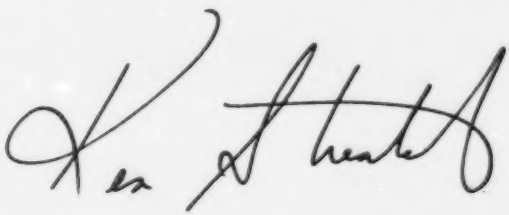
for the fiscal year ended
march 31, 1982

To His Honour
The Honourable John E. Shaffner
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour to submit herewith the Eighteenth Annual Report of the Department of Fisheries, for the fiscal year ending March 31, 1982.

Respectfully submitted,



Ken Streatch
Minister of Fisheries

To the Honourable Ken Streatch
Minister of Fisheries

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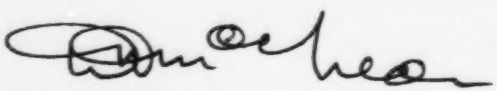

D. A. MacLean
Deputy Minister

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THE FISHING INDUSTRY

Landings of commercial marine species in Nova Scotia continued to improve in 1981, establishing a new record in both landed weight and landed value.

Fishermen in the province landed 479,327 metric tons of fish, shellfish and marine plants in 1981, representing a 7.1 per cent increase over the 1980 catch of 447,549 metric tons. The landed value of all species increased 14.2 per cent to $263.7 million

Scallops continue to be the most important species in landed value, returning $88.3 million to this sector of the fishery. The landed value of cod continues to steadily increase, reaching $53.9 million in 1981, while lobsters also climbed significantly to $41.3 million.

Groundfish landings increased 6.2 per cent while the landed value of this species group rose 10.8 per cent. The pelagic and estuarial species group showed a modest decline of 1.4 per cent in landings; however, sharp herring price declines caused a 40.2 per cent drop in the landed value. The mollusc and crustacean species group recovered most of the ground lost in 1980, recording a 19.9 per cent increase in landings and a 31.8 per cent increase in landed value.

During the year, several sectors of the industry, notably herring and frozen groundfish, suffered a cost/price squeeze that caused hardship. However, the diverse nature of the fishery enabled the industry in Nova Scotia to fare much better than that in other Atlantic coast provinces where plant closures and bankruptcies have occurred.

INDUSTRIAL DEVELOPMENT

The further development of fish quality, safety and operational efficiency are three major areas of activity carried out by the Industrial Development Division through various programs. By providing both technical and financial assistance to eligible applicants, the fishing industry is assisted in developing its potential to take advantage of the available resource.

Financial assistance provided by the division was generally based on a 50 per cent cost-sharing arrangement with the applicant, up to a maximum contribution of $15,000. Technical assistance was also available upon request for projects undertaken by industry, with emphasis being given to innovative projects or to new technological developments.

Technology Development - Fishing Vessels

Efforts continued with the offshore fleet where four vessels were converted to boxing their catch at sea. Approximately one-third of their hold capacity was modified in order to accommodate iced and boxed fish. The results have been very encouraging with the market reacting favourably to the improved quality of the landed fish.

With the co-operation of industry, various fuel saving devices were evaluated and a project was carried out with a vessel owner. This demonstration project helped make fishermen more aware of fuel savings resulting from proper use of engine speed.

Technical staff members were also involved in several vessel conversions where their knowledge was essential to the design of proper deck lay-outs and gear arrangements.

Consultation with the shipbuilding sector continued on various topics such as propulsion systems, fish hold modifications and general construction methods.

Technology Development - Fishing Gear

Improved and more efficient methods of catching traditional and underutilized species was the main thrust of this section of the Industrial Development Division.

Work continued with the random baiting systems and a number of them were introduced in Southwestern Nova Scotia. Initial results were very

encouraging and many traditional "tub" fishermen turned to this type of longlining.

A technical evaluation of the various fish-gutting machines was carried out with input from the distributors and users of the machines. Some minor problems were identified and resolved.

The introduction of monofilament to the longline sector was a project that drew interest from all parts of the province. Work is ongoing and it is hoped that some adaptation may be made to the random baiting units to accommodate this new material.

The further development of otter trawls remained a priority and various groups received the benefit of the technical expertise available from the division.

Near year's end, work commenced on a mechanical fish washer that could be adapted for both inshore and offshore use.

Technology Development - Shore Based Facilities

The technical staff continued to develop comprehensive construction guidelines for onshore projects assisted through the financial incentive programs of the division. In many cases, this included onsite supervision by the division's engineers, who were assisted in the summer months by engineering students.

Various processors were assisted with the installation of dehumidified fish dryers. These units provide not only a saving in terms of fuel usage but enable more flexibility in a plant's production cycle.

A fish waste processing study was completed and a number of recommendations are under examination for possible implementation.

A trial project was conducted using carbon dioxide as a fish chilling agent. The project, completed in conjunction with a processor, fishermen and a carbon dioxide distributor, produced interesting but inconclusive results.

Product Technology and Process Development

Financial and technical assistance was provided to processors and other fishing interests for developmental projects related to the processing technology of traditional and under-utilized species.

A joint stockfish project was undertaken with the co-operation of a local processor and the Market Development Section of the Planning and Finance Division. One container load of product was produced and initial results appear promising.

Added value processing of swordfish was examined by smoking a considerable quantity of fillets. Initial consumer reaction has been quite favourable and development work will be continued with canned and individually quick frozen (I.Q.F.) packs.

The minced lobster bait bag trials were continued at Arisaig. The survey and experimentation provided valuable information that will be used to further evaluate this alternative and potentially lower cost method of baiting lobster traps.

Studies were initiated to evaluate the effect on fish quality resulting from the use of various preservatives added to the ice in which fish is stored. Work will continue in this area during the next fiscal year.

Much discussion has taken place on the use of crab and fish wastes in the area of horticulture and fertilizers. An evaluation was conducted on product values during the year.

Studies of fish silage were continued from the previous year through feed trials on hogs.

Financial Incentives - Fleet Development

The program's objective was to upgrade the existing fleet in order to take full advantage of the available resource and meet the demands of the marketplace.

Safety is of utmost importance to the division and this was evident by the continuation of cost-sharing for the purchase of approved liferafts.

Over 50 fish-hold refrigeration and insulation projects were completed under a cost-sharing arrangement. Eligible applicants had to comply with construction guidelines developed for this type of vessel upgrading.

Cost-sharing, on the basis of 50 per cent, was also provided to inshore fishermen wishing to equip their vessels with insulated fish storage containers.

A program to fit propellor nozzles on 45 to 65-foot fishing vessels, as a

means of improving fuel efficiency, was continued. All installations of these energy saving devices were monitored by technical staff.

The program to equip vessels with fish gutting machines was expanded. Fourteen projects were cost-shared on a 50 per cent basis and the results have been very promising.

Financial Incentives - Harbour Facilities

The program for improving available facilities in harbours around the coast consisted of two major areas: private wharves and fishermen's haul-outs. The fishermen's service shed program was cancelled for this year while staff examined the results to date and developed guidelines for an improved program for the 1982-83 fiscal year.

Private wharf repair and new construction were carried out by fishermen's groups and local processors. Funding was available for approved material, up to a maximum of $15,000, to groups of four or more fishermen or registered fish plants. Other eligible applicants received a maximum of $10,000. Twenty-three facilities were upgraded during the course of the year.

A number of fishermen's slipways were completed according to specific guidelines established by the division. Funding was available to a maximum of $15,000 for approved material.

The division funded the construction of three haul-out winches in co-operation with the manufacturer and Small Craft Harbours Branch, Department of Fisheries and Oceans. These were installed at three selected locations and the Department will decide on a continued program for next year.

Financial Incentives - Infrastructure

A number of projects were undertaken to improve existing electrical facilities in and around fish processing plants. Of primary importance was the effect which such improvements would have on energy consumption.

Given the lack of adequate fresh water in some areas of the province, the division provided financial assistance to many plants in Nova Scotia which were developing or upgrading their own water supply systems. The program was co-ordinated with the Nova Scotia Department of Environment and 50 per cent cost-sharing was provided to a maximum of $2,500.

Financial Incentives - Quality

The division decided to increase its maximum contribution to $30,000 for eligible applicants wishing to construct ice making and storage facilities. By so doing, applicants were further assisted in the completion of suitable ice making and storage facilities under a 50 per cent cost-sharing arrangement.

The cool and cold storage program provided much needed assistance to processors wishing to construct such facilities to hold raw material and/or finished products. The 50 per cent cost-sharing to a maximum of $15,000, aided in the completion of 23 projects throughout the province.

The division provided 50 per cent cost-sharing on the purchase of fish handling containers and salt fish tanks by fishermen and processors. These containers were constructed of approved materials, usually plastic or fibreglass. The primary objective was to improve the quality of the landed catch.

Financial Incentives - Productivity

A marked increase in the number of tubs fished per boat and a general shift to longlining from other types of fishing has placed a strain on existing trawl tub storage facilities. This program has been developed to alleviate this problem by assisting in the expansion of existing facilities in addition to the construction of new ones by providing 50 per cent cost-sharing to a maximum of $15,000.

There was a significant demand for bait storage and handling facilities in the province, with special emphasis on Cape Breton. The majority of these projects were funded jointly by the Department and fishermen's groups, with priority given to those projects which provided benefits to the maximum number of fishermen in each port.

The division provided financial assistance for more efficient methods of unloading, such as the auto-dumper developed last year by a Prince Edward Island manufacturer. A decision was reached not to fund any vacuum unloaders until trials were completed concerning the various models and their operation.

No assistance was available to those who wished to expand or construct processing facilities for traditional species.

FISHERIES LOAN BOARD

During the 1981-82 fiscal year, the loan activity of the Fisheries Loan Board continued to diminish from its peak level two years ago.

Twelve Board meetings were held and of the 621 applications considered, 382 were approved, 206 were rejected and four deferred, while the balance were either withdrawn or returned to the applicant because they did not qualify under the Board's regulations. The number of applications being rejected has increased dramatically primarily due to increased research into the applications by staff and because of a "tightening up" policy by the Board itself. Gross value of approved loans totalled $20,971,931 with the net value, after down payments and subsidies, being $17,481,477. Vessel subsidies and grants amounted to $1,265,375 on 65 applications; 167 loans were paid off during the year.

The following table compares loan activity over the past five years:

Year Ending Mar. 31	Loans Considered	Loans Approved	Net Amount Approved	No. of Outstanding Loans	Amount Outstanding
1978	179	169	3,190,554	602	11,406,098
1979	641	607	30,400,000	1,081	21,400,000
1980	929	852	52,550,000	1,765	59,082,800
1981	914	738	39,438,410	2,108	92,434,367
1982	621	382	17,481,477	2,261	107,616,697

In addition to the outstanding loans of $107,616,697, during the year there were commitments of $6,041,178. Advances during the year amounted $28,855,392 and repayments on loans amounted to $13,843,015.

A breakdown of the type of loans approved is as follows:

	No.	Amount
New boats to 44'	105	$ 4,520,287.15
New boats to 44'11"	10	1,807,372.60
Draggers and seiners 45' - 100'	7	1,997,353.70
Longliners 45' - 100'	10	3,015,242.02
Used boats to 45'	65	3,015,949.15
Used boats 45' - 100'	3	810,900.00
Diesel engines	40	456,088.88
Gas engines	14	47,520.42
Deck equipment	42	917,321.28

	No.	Amount
Electronics	61	247,263.15
Conversion	20	602,602.09
Aquaculture	4	43,576.68
	381	$17,481,477.12

Loans approved, by counties, were as follows:

	No.	Amount
Annapolis	10	$ 1,330,538.79
Antigonish	15	161,529.45
Cape Breton	42	1,303,648.20
Colchester	1	14,859.00
Cumberland	--	--
Digby	33	3,080,943.24
Guysborough	15	698,312.92
Halifax	35	999,445.43
Hants	--	--
Inverness	23	292,217.38
Kings	1	2,700.00
Lunenburg	7	753,738.77
Pictou	19	225,105.24
Queens	11	1,432,389.10
Richmond	12	362,115.06
Shelburne	90	4,964,684.09
Victoria	14	278,552.88
Yarmouth	43	1,580,697.57
	371	$17,481,477.12

Technical and Inspection Services

During the fiscal year under review, 196 boats of all sizes were completed with Loan Board financing. Technical services were provided both during the preliminary planning and construction stages of these boats. Progress inspections were made by the inspection staff on 236 boats and at the end of the fiscal year 53 of these boats were still at various stages of construction and subject to further inspection. In addition, 187 used boats were inspected and appraised, 140 boats were inspected for engines, equipment and upgrading and nine boat shops were inspected. Three hundred and fifty-seven boats were inspected for maintenance and housekeeping.

The following new builders were added to the Board's list of approved boat-builders:

Covey Island Boatworks Ltd., Bush Island, N. S.
Tri County Fibreglass Ltd., Wedgeport, N. S.
William K. Dixon, Lower Woods Harbour, N. S.
John A. Fraser, R.R.#3, Bras d'Or, N. S.
Joseph G. Gaudet, Janvrin Island, N. S.
Stanley Greenwood, Cape Sable Island, N. S. (fibreglass)

TRAINING AND FIELD SERVICE

TRAINING

The Department's training programs operated on a wide basis serving the needs of the fishing industry, other government agencies and fishermen from overseas.

New records were achieved for 1981-82 in terms of the number of participants, 1,141, and the number of courses, 112.

The services offered by the division are as follows:

	INSHORE	OFFSHORE	PROCESSING
NAVIGATION	Small Craft Master Fishing Master Class IV	Fishing Master I Fishing Master II Fishing Master III	
ENGINEERING	Small Gas and Diesel Diesel Engines Hydraulics	Watchkeeping Engineer Fishing Vessel Chief Engineer 4th Class Engineer	Refrigeration for: Small Plant Operator Assistant to Plant Engineer
FISHING GEAR TECHNOLOGY	Basic Skills in Repair and Construction	Deckhand Trawlerman	
SAFETY	Marine Emergency Duties I Fire Fighting Life Saving, Survival First Aid	Marine Emergency Duties II Life Saving, Survival First Aid	
BUSINESS PRACTICES	Family Business Record keeping Taxation Financial Decision-Making		Small Plant Operator Record keeping Finance Management
QUALITY CONTROL	Included in Fishing Gear Program	Included in Trawlerman Course	Production Staff
ADVISORY SERVICES	Fishing Gear and Engineering	Design of Special Programs	Design of Special Programs

Transport Canada Certificate Examinations

A heavy demand for training in navigation and safety led to an unprecedented number of courses being conducted during 1981-82. The main thrust of this demand came from the inshore fleet. While there is no current regulation for Transport Canada certification of the inshore fleet, there is considerable interest in safety and navigation training leading to certification as Fishing Master Class IV.

The safety and navigation certification programs were conducted at the School of Fisheries, Pictou and in 38 locations throughout the province.

For 1981-82, the Training and Field Service Division again achieved the highest success rate in the country in Transport Canada Navigation Certificate examinations. In addition, it trained the highest number of fishermen in Marine Emergency Duties I. The results are as follows:

Transport Canada Certificate	Number of Courses	Number of Fishermen Attended	Number of Fishermen Passed
Fishing Master Class IV	17	186	183
Fishing Master Class III	6	46	41
Fishing Master Class II	2	14	12
Marine Emergency	28	277	277

Extension Programs in Fishing Communities

A breakdown of the training programs conducted in the fishing communities is as follows:

	No. of Courses	Students Enrolled	Students Completed
Navigation	17	186	183
Inshore Fishing Operations	13	149	141
Business Practices	14	154	154
M.E.D.	23	246	246
Small Gas Engines	3	28	26
Radio Telephone	19	226	224

The planning and co-ordination of the programs in the fishing communities is facilitated through the work of the Department's Fisheries Representatives and the co-operation of Canada Manpower officials. Funding for the courses at Pictou and the extension programs is provided through Canada Employment and Immigration and is administered by arrangement with the joint Federal-Provincial Institution Training Committee.

Nova Scotia School of Fisheries, Pictou

A breakdown of the courses conducted at Pictou is as follows:

(a) Programs under Canada Manpower Institutional Training Program:

	No. of Courses	Students Enrolled	Students Completed
Navigation	8	60	53
M.E.D.	5	31	31
Watchkeeper	2	8	4
Deckhand	4	21	15

(b) Overseas Fishery Training

This is a joint venture between the Department and the Canadian Industrial Development Agency (CIDA-VADA)

	No. of Courses	Students Enrolled	Students Completed
Refrigeration	1	4	4
Diesel Engines	1	8	7
Navigation	1	8	8

(c) Other Government Agencies

	No. of Courses	Students Enrolled	Students Completed
Attorney General (Deckhand)	3	40	40
Attorney General (Engine Repair)	1	10	10
Federal Fisheries (Chartwork)	1	11	11

Training Summary

There has been a marked increase in the demand for fisheries training as shown by the following table:

	1978-79	1979-80	1980-81	1981-82
Number of Courses	53	67	96	112
Number of Trainees	531	697	1,100	1,141
Number Completed	492	639	1,008	1,107

FIELD SERVICE

The Field Service continued to maintain a high profile in the fishing industry throughout Nova Scotia.

Over 620 loan applications went to the Loan Board during the year under review and each of these had a confidential report from the local fisheries representative. Financial advice, forms and loan information were repeatedly supplied to fishermen as most initial contacts and follow-up were through the Fisheries Representatives.

Hundreds of Industrial Development Division applications for assistance (types mentioned elsewhere in this report) were taken and each was rated according to impact and priority. Progress on approved projects was monitored by the representatives and technical information was often supplied as well.

Training activities continued in all nine of the fisheries representatives' regions. These local training programs were promoted and to a large extent co-ordinated by the field staff. As a result about 90 extension courses were offered in fishing communities around the province while other fishermen were encouraged to attend the more than 20 courses offered at the School of Fisheries in Pictou.

It appeared at the beginning of the fiscal year that considerable time and effort would be spent on the administration of Fishermen's Reserves and a program geared to upgrading roads to wharves. Both involved working in conjunction with other Departments (Lands and Forests and Transportation respectively). Although neither has developed to expectation, some progress was made.

During the year a slight realignment in job functions was instituted. This resulted in more emphasis being placed on the solving of local problems and the liaison aspects that were so prevalent in the intial establishment of the Field Service. Besides handling many individual and collective problems of fishermen, the fisheries representatives constantly relayed requests for improved harbour facilities, better navigational aids, subsidies, licensing matters and the like to federal departments for action.

Dispensing information on government programs and policies continued to be an important role of the section and in addition there was participation in industry meetings, exhibitions and career days. Some Field Service staff served on a number of official committees including the Marine Safety Advisory Committee, Scallop Advisory Committee and the

Annapolis Valley Affiliated Boards of Trade (Fisheries Sector).

All proposed dumpsites for dredging spoils were checked out with local fishermen and the findings were transmitted to the Department of Environment. Where good fish bottom could be destroyed or impaired, alternate dump sites with accurate co-ordinates were often supplied.

Additionally, a host of federal and provincial employment programs were sponsored by the fisheries representatives during the year.

MARINE RESOURCES DIVISION

The Marine Resources Division represents the Department and the fishing industry of the province as a whole on numerous government-industry advisory committees. Its function is to ensure that the needs of the industry are adequately considered in the development and implementation of management plans for the various fisheries in which provincial fishermen participate. This year the division was represented on 21 official advisory committees dealing with groundfish, pelagics, marine plants and crustaceans. In addition, the division represented the Department on three offshore oil and gas committees. It has been delegated to represent the province on the joint Nova Scotia-Canada Fisheries Advisory Committee, as provided for in the Canada-Nova Scotia Agreement on Offshore Oil and Gas Resource Management and Sharing. Through these committees, the Department ensures minimal interference with the fishing industry as a result of offshore developments and interacts directly with the Canadian Oil and Gas Administration.

The Resource Management and Research section of the division is divided into three units, each dealing with a particular species group: marine plants, crustaceans and pelagic fish. As well as providing expertise in their specific fields for management of the resource, each unit is involved in research programs investigating species and stocks of specific interest to Nova Scotia. These studies are important to the development of new fisheries for the future and to improved management for the present. These programs involve considerable field work for which students are employed. Details of these studies are as follows:

Marine Plants

Research necessary for the development of an optimal harvest strategy for kelp (**Laminaria**) in southwest Nova Scotia continued in 1981. Although this work will not be complete until early 1983, preliminary results indicate that the most abundant kelp **Laminaria longicruris** recovers rapidly from harvesting both in recruitment capability and growth rate. **Laminaria digitata**, which is less abundant, regrows more slowly and has a lesser recruitment capability. Although only a preliminary assessment, it appears that the high recruitment ability and regrowth rate of **Laminaria longicruris** will permit a certain level of sustained harvesting on a yearly basis. At present, only small amounts of **Laminaria** are harvested in Nova Scotia. However, officials from the marine plants industry continue to indicate strong interest in harvesting Nova Scotia kelp, both for extraction of alginates (used in many industrial and food processes) and for consumption as an exotic vegetable (kombu).

Crustaceans

In 1981 the division continued its research program investigating various aspects of the growth and survival of stage four juvenile lobsters. Hatchery reared animals were placed in enclosed structures in the field and subjected to a number of different environmental conditions. The work is yielding information on the behavior of juvenile lobsters and identifying the bottom which appears to be the most suitable habitat for animals of this size.

A lobster hatchery located at Dalhousie University provided about 40,000 stage four juveniles for field study last year. A number of these lobsters were monitored under experimental conditions while others were released at selected sites near the study area in Lennox Passage, Cape Breton.

An underwater research team stationed in Cape Breton conducted the field work in Lennox Passage. In addition, this group participated in lobster-scallop fishery interaction studies in Northumberland Strait and provided assistance to oyster aquaculture projects in the Bras d'Or Lake.

In 1981 the division again participated in a port sampling program collecting information on lobsters and crabs at fishing ports around the province. Biological data including size frequencies, catch effort and reproductive potentials were gathered and will be used to assess the fisheries as they exist and to project how they may respond in the future.

Herring

On-going studies of the Bras d'Or Lake and Pictou Island herring fisheries have examined some of the adult population characteristics of size and age composition, growth, reproductive maturity and the like. Since the early life history of fish appears to be extremely important in understanding population dynamics, egg and larval surveys were conducted in the Bras d'Or Lake to study: (1) spawning substrate, environmental conditions, egg density and mortality; and (2) larval production, dispersal and mortality.

Gaspereau

Little information exists on the biology of gaspereau stocks which spawn in Nova Scotia rivers and lakes. In 1981 gaspereau stocks from the South West Margaree River and Pictou Harbour were studied, since both river systems support commercial fisheries. A fish tagging project on the Pictou stock indicated a widespread summer movement of fish within the Gulf of St. Lawrence and a fall migration out of the Gulf for overwintering in either

Northwest Atlantic Fisheries Organization sub-area 4Vn or 4Wa. A tagging study was also conducted on the Margaree stock, with returns expected in 1982. For purposes of stock assessment, data has been collected on relevant biological parameters, such as size and age composition and historical catch and effort data. The ultimate goal of these studies is to establish the criteria for year-class success, which would be of assistance in the future management of the fishery.

ESTUARINE AND INLAND FISHERIES

This division is responsible for planning, developing and carrying out departmental policies and programs to conserve and enhance the fisheries resource at the land-water interface. Major responsibilities include:

1) carrying out resource inventories of estuarine species for input to resource management decisions, commercial development and land use planning;

2) conducting pilot-scale studies, applied research and extension work associated with the development of aquaculture opportunities in shellfish (oysters, mussels) and finfish in estuarine and inland waters;

3) providing departmental input to both provincial and federal agencies and intergovernmental committees concerned with managing the resource base in the coastal zone.

The division maintains and operates its own oyster hatchery at Pleasant Point, Halifax County, as well as a pilot-scale demonstration site in adjacent waters for off-bottom oyster and blue mussel culture. Towards year end, the division was in the process of assuming administration of a trout hatchery and rearing facility located at Fraser Mills, Antigonish County, from the federal Department of Fisheries and Oceans.

Aquaculture Development

(a) Adult Conditioning and Spawning **Ostrea edulis**

Work carried out during the 1979-80 seasons indicated that greater numbers of vigorous larvae could be obtained if the adult brood-stock was conditioned at salinities higher than 27 ppt. As the ambient salinity at the Pleasant Point Hatchery never reaches that level naturally, the optimum salinity was achieved by the addition of a commercial salt mix to the adult holding tanks. A further benefit of the salinity increase was a marked decrease in the length of adult conditioning time needed to obtain a larval release with a resultant saving in food and labour.

During the 1981 season, in an attempt to minimize the cost of this procedure, a series of tests were conducted comparing adult conditioning time and larvae production of brood-stock maintained under three experimental regimes - (1) ambient salinity; (2) elevated salinity using the commercial salt mix, and (3) elevated salinity using NaCl (fish pickling salt). The tests were run three times during the operating season and the results

indicated conclusively that the addition of NaCl to the adult holding water was not a satisfactory substitute for the commercial salt mix as few larvae were produced by the adults held in this solution and all larvae died after a few days upon release. Larvae released by the adults in the commercial salt solution and to a lesser degree by those at ambient salinity were successfully grown to setting size.

(b) Cultchless Setting

The technique of producing cultchless (singulated) oyster seed on shell fragments, first attempted during the 1980 season, was further refined and is now the standard setting method used. The switch to cultchless seed production necessitated the modification of the techniques for handling post set spat. Work is continuing on the development of a satisfactory nursery system for seed 2-5 mm shell development.

(c) Pilot Seed Production

Approximately 150,000 cultchless **Ostrea edulis** seed (shell length 2 - 5 mm) were produced for the industry. An additional 32,000 **Ostrea edulis** seed were produced for research by the division. About 28,000 **Crassostrea virginica** seed were produced and are being held at the Pleasant Point Hatchery.

(d) Bacterial Survey

During July - August the staff at the Atlantic Fish Health Unit, federal Department of Fisheries and Oceans, conducted a thorough bacterial survey of the Pleasant Point Hatchery. Their findings identified two probable sources of bacterial contamination: the algal stock flasks and the open air vents on the carboy cultures. Procedural changes designed to eliminate these two problem areas appear to have been successful as bacterial contamination of the algal cultures has been greatly reduced during the present operational season.

(e) Adult Grow Out

A series of tests to determine growth rates, survivorship and market quality of **Ostrea edulis** grown in suspension culture at various locations in the province was recently completed. A major report on the results is now in preparation. In connection with this study, Scotia Biological Services was employed under contract to conduct a detailed survey of fouling organisms found on the oyster culture equipment in an attempt to formulate a

management regime and/or treatment to eliminate this problem as much as possible.

(f) Bras d'Or Oyster Seed

During the past season a co-operative study with Cape Breton Marine Farming Ltd. was conducted to test the suitability of Bras d'Or Lake oyster seed for ongrowing to market size in the coastal areas of the mainland where seed is scarce. The results indicated that the causative agent of Malpeque disease was still active at the Pleasant Point site and that the Bras d'Or seed were very susceptable to the organism and suffered high mortalities. A detailed report on the test results was completed.

(g) Algal Culture System

During the 1981 season, the Pleasant Point Hatchery, which was formerly dependent upon the shellfish production unit at Dalhousie University for about 40 per cent of its algal food, achieved self-sufficiency in algal production. The increased productivity was attributed to the use of a more balanced nutrient supplement and isolation of the stock cultures from the Pleasant Point facility, which greatly improved the vigour and longevity of the algae; and improved management and utilization of the large fiberglass (Kalwal) tubes to supply the seeds of the adult brood stock and the post-set spat.

Tests were also begun on outdoor production of algae in free standing fiberglass tanks. To date this has been successful only during the warmest part of the season (mid June - mid August). At other times, heat gain during the day does not compensate for heat loss at night resulting in below optimum temperatures for algal growth.

(h) Clam Production

Adult quahogs (**Mercenaria mercenaria**) obtained from the Northumberland Strait were successfully conditioned and spawned in the hatchery during August 1981. Sufficient time was not available to raise the larvae to the point of setting and as a result approximately 400,000 were released into the Pleasant Point pond. The same technique was employed during March 1982 and approximately 3,400,000 vigorous larvae were obtained and grown to setting size. Although it is too early to determine the number that will survive to the 5 mm size, it is hoped that sufficient quantities will survive to permit experimental outplantings to selected bottom plots during the 1982 season.

(i) Mussels

During the year under review, the division provided 2,380 plastic mesh collectors, with 1980 year class seed attached, to those in the industry. In addition, 3,700 collectors were constructed and set out for 1981 seed. Sales to the industry at $3.00 a collector began in September and will be completed by the end of June 1982.

Collectors and spat were provided to twelve new growers for site testing and the division conducted nine detailed site evaluations for prospective mussel growers.

The work of the division, including the detailed reports prepared after years of developmental efforts, is being sought by those in the industry. As a result, 23 detailed replies were mailed to those seeking information on mussel culture. These included 13 requests from Nova Scotia, one from India, one from Jamaica, two from New Brunswick, three from Prince Edward Island, one from British Columbia and one from Maine.

During the year the division initiated a test series designed to provide growth rates, yields and relative cost figures on two methods of mussel culture: 1) utilizing the standard plastic mesh collector, and 2) utilizing the technique of thinning and resetting. This test series is ongoing and will be completed during the 1982 season.

In conjunction with the Product Technology Section, Industrial Development Division, and the Technical University of Nova Scotia, assistance was provided in the design of mechanization for collector stripping, declustering, grading and washing cultivated mussels.

(j) Trout and Salmon

Salt water grow out tests were conducted and rainbow trout were successfully overwintered at two locations on the Eastern Shore. This has opened the possibility of commercial culture of this species and even more importantly of Atlantic salmon at these sites. An Atlantic salmon culture project, cost-shared by the Department and Seabright Ocean Farms, was initiated for the 1982-83 season at one of the test sites.

A joint study with Cape Breton Marine Farming Ltd. was conducted to determine the feasibility of using waste heat from the Lingan Power Station for the culture of Atlantic salmon.

Four detailed site evaluations were conducted during the year for prospective trout growers.

(k) Extension Services

More than 80 requests for information, site evaluations and technical exchange were responded to during the year. In addition, two educational programs, one career day and three hatchery tours were arranged for local schools.

The work of the division was displayed at the world level through attendance at the World Mariculture Society annual meeting, the American Trout Farmers annual meeting, and the Maine Aquaculture Association annual meeting. In addition, 13 intergovernmental meetings on related subjects were attended.

The annual highlight of the extension work was the acceptance of mussels and oysters promoted at the spring food show, Rendezvous '82, in Montreal.

Resource Inventories

(a) Soft-Shell Clam Inventory (Eastern Shore)

Soft-shell clam population surveys were conducted at Chezzetcook and Sonora harbours on the Eastern Shore during the summer of 1981. The fishery in this area was thought to comprise a substantial portion of the total harvest in the province, but this could not be ascertained from landing statistics since much of the catch is either transported out of the area for processing, sold privately or dug recreationally, thereby not being reported by sales slips. In 1981 it is estimated that only 10 per cent of the total landings for the area were reported to the Department of Fisheries and Oceans. The surveys were therefore initiated by the Nova Scotia Department of Fisheries to assess the resource. This information will also be valuable in addressing concerns as to the future direction of industrial growth on the Eastern Shore and the resultant impact it could have on the area's natural resources.

Fishing intensity at Chezzetcook Harbour during 1981 appeared to be higher and stock densities lower than at Sonora. Recent years of excellent production of young should increase abundance and harvest in six to seven years at Chezzetcook, thus offsetting the higher levels of exploitation there. At present harvesting rates, stock abundance is likely to decline at Sonora.

Long term stability of this fishery is related to annual success of juvenile production, which in turn is affected by natural or man-made disasters and indirectly by heavy fishing. Since growth rates are slow (six to seven years to reach market size), any future lowering of juvenile survival will produce even longer term effects on brood stocks and numbers of clams available for harvest.

The clam fishery on the Eastern Shore was substantially more important prior to the 1950's after which, it is believed, overfishing reduced stock abundance to significantly lower levls. In 1981 the fishery supported approximately 41 full-time diggers and three buyers in addition to many others on a part-time basis. Estimated landings represent 20 per cent of the provincial total. The Eastern Shore fishery was worth about $136,346 in the shell, likely an underestimate as the value of the part-time and recreational harvest and the resultant tourist expenditures cannot be assessed. Statistical data indicates that catches have fluctuated since the 1950's. This situation is likely to continue; in fact, stocks may again be on a downward trend.

(b) Glass-Eel Study

Upstream migration of glass-eels, elvers and juvenile eels in Nova Scotia waters has received little scientific study to date. However, measurement of recruitment potential of eel populations is essential to calculations of the dynamics of the species in different areas. These measures, combined with population estimates and fishing effort, serve to outline pictures of future populations at various fishing intensities.

Studies of upstream migration of glass-eels were undertaken by the Department in 1982. Elver trap nets of two types were designed and constructed to monitor movements of migrating elvers. Temperature and tidal flow were found to be more influential than lunar period on elver migration. It appears that the elvers entered the estuaries in several waves, as indicated by a change in the degree of pigmentation displayed by a sample. Selected rivers in Yarmouth and Richmond counties were surveyed.

(c) Adult Eel Study

A provincial survey of adult eel stocks at 25 locations in Nova Scotia has been completed for the year 1981. A summary of data on population densities, age-length-weight distributions, feeding habits and mercury content has been presented. Populations of younger, larger eels were found to exist in the North Shore area. All areas were characterized by a range of food items including eels, numerous fish species, insects and other non-fish organisms. Aging techniques employing otoliths in alizarine red stain

allowed for a large number of otoliths to be examined. Total mercury content for all eels was found to be 0.41 +- .01 ppm, which is within the Canada-United States allowable levels for marketable fish.

The value of the eel fishery promises to escalate substantially in the next few years. Sources of eel consumed on foreign markets are limited, while demand continues to grow. Information gained through these studies will serve as a basis for management practices. Effective management will ensure the eel fishery is sustainable and the eel populations remain at levels of optimum yield.

(d) Commercial Status - Eel Fishery

Eel fishing in Nova Scotia provided seasonal employment for approximately 74 fishermen in 1981. Total landings are estimated at 54 metric tons, up from 45 metric tons in 1979. The average price for live weight increased 17 cents in the same period to $1.82/kg. The total estimated value for 1981 is $103,674 - believed to be an underestimate.

(e) Groundwater Quality Maps

A preliminiary review was made of the available information on groundwater supplies in Nova Scotia suitable for aquaculture operations. From this, a series of maps was formulated depicting bedrock and surficial water quantity and quality, including the occurrence of any undesirable components.

Refer to:
Connor, M.A. 1981. Groundwater mapping for aquaculture purposes. N. S. Dept. of Fisheries.

(f) Fisheries Atlas

The purpose of the Atlas is to provide under one cover the essential facts concerning the fishing industry of Nova Scotia that are of value to fishermen, processors, administrators, educators and students, and of interest to the public in general. This has been realized in the 14 extensive maps to be found in the publication showing landings, major species, fishing fleet, employment, onshore facilities, infrastructure and exports.

Refer to:
Anon. 1982. Nova Scotia Fisheries Atlas. N. S. Dept. Fisheries.

(g) Reports

1) Hutchison, S. J. 1981. Upstream migration of the glass-eel (**Anguilla rostrata**) in Nova Scotia-1981. N. S. Dept. Fisheries, Manuscript No. 81-02.

2) Hutchison, S. J. 1982. Assessment of the eel (**Anguilla rostrata**) population in Nova Scotia, 1981. N. S. Dept. Fisheries, Manuscript No. 82-01.

3) Hutchison, S. J. 1982. Design and construction of two elver trap nets. N. S. Dept. Fisheries, Manuscript No. 82-02.

4) Hutchison, S. J. 1982. Notes on the eel fishery in Nova Scotia-1981. N. S. Dept. Fisheries.

5) Witherspoon, N. B. 1982. Population surveys of the soft-shell clam (**Mya arenaria**) in selected estuaries on the Eastern Shore of Nova Scotia, 1981. N. S. Dept. Fisheries, Manuscript No. 82-03.

6) Greig, Ursula. 1982. Biological components of oyster tray fouling in Spanish Ship Bay and Ostrea Lake. N. S. Dept. Fisheries.

PLANNING AND FINANCE

This division provides administrative support to the Department as a whole, including financial, personnel and office services. In addition, planning, economics and statistical services are provided to the Department.

Market development and promotion activities continue to play an increasing role in the division's activities in an attempt to improve market opportunities for fishery products from Nova Scotia.

Information services are also provided for both those in the fishing industry and the general public.

Some of the major projects undertaken by the division during the year under review include:

Economic Studies and Projects

(a) Development of D.R.E.E. Sub-agreement Proposal

A draft Department of Regional Economic Expansion subsidiary agreement for the Nova Scotia fishery was once again prepared during the year. This proposal included programs for upgrading and development of fishing port infrastructure, dredging of harbours, aquaculture and sea farming, and fisheries training.

No progress, however, was made in attaining an agreement primarily due to the reorientation and reorganization of the D.R.E.E. function within the federal government.

(b) Georges' Bank Boundary Issue

Both Canada and the United States have agreed to submit the Gulf of Maine-Georges' Bank boundary delineation dispute to the World Court in The Hague for final resolution. During the course of the year under review the Department maintained liaison with the Department of External Affairs on this matter, and on occasion, provided information to assist in the development of Canada's case.

(c) Fish Inspection Regulations

Work progressed on the preparation of provincial fish inspection regulations and the design of a related system for the licensing of fish processing establishments in Nova Scotia. Discussions are continuing with

the industry on the details of the proposed regulations and their implementation.

(d) Fishing Vessel Cost and Earnings Study

The cost and earnings study of fishing vessels in Nova Scotia was continued as a joint project with the federal Department of Fisheries and Oceans. Operating data from a representative sample of various types of fishing vessels was collected and analysed to produce an annual report summarizing the economic performance of each vessel class.

The information from this ongoing study is used by government and the industry for a variety of purposes including financial analysis of investments in fishing craft, comparing the performance of various types of vessels and fishing gear, and assessing the impact of specific cost and earnings factors such as increasing energy costs and vessel licensing policies.

(e) Economic Analysis of Near Shore Vessels

Analysis of near shore groundfish fishing vessels in the 42' to 65' size range was completed with an emphasis on the variability in landings for each size and type of vessel (trawling, longlining, Danish seining and the like). Data on landings, obtained from the Department of Fisheries and Oceans, indicated a wide variation in landings amongst similar types of vessels. The landings of the better longliners compared favourably with vessels using other types of gear. Related economic analysis indicated the financial impact of such variations in landings.

(f) Socio-Economic Data

Briefings were prepared on several specific fish species which were encountering economic or marketing difficulties during the year. A variety of economic and statistical information was also provided to other areas in the Department in support of their program planning and evaluation activities.

(g) Port Profiles

A survey of all the fishing ports in the province was completed during the year to identify the facilities in each harbour, the condition of such facilities and the need for improvements. The information, gathered by the Department's nine fisheries representatives, was combined with data on landings, fishing vessels and processing facilities to provide overall fisheries profiles on each port. This information will be entered into the Depart-

ment's computer system during the next fiscal year to facilitate updating and retrieval.

Market Development and Promotion

(a) General

Programs aimed at increasing consumer awareness and consequently the consumption of seafood included the use of exhibitions, mall displays, regular radio interviews and demonstrations. In addition, a placemat promoting seafood was produced to utilize the "Seaside Spectacular" theme for the 1981 tourist season and was distributed throughout the province in conjunction with the Nova Scotia Restaurant and Food Service Association.

The staff home economist provided support services to industry at national and international shows. As well, product samples were prepared and distributed to potential customers and assistance was provided in setting up display cases.

(b) Market Development Programs

The Directory of Nova Scotia Fish Products was updated and reprinted to provide information on the availability of various fish products from the province. In addition, the Department co-sponsored an export seminar to improve the exporting skills of small to medium size fish processing companies.

During November Fish and Seafood Month a major fresh fish promotion was conducted in the Ontario retail market. Point-of-purchase displays and promotional aids were provided to the supermarket chains involved.

Provincial participation in two major Canadian trade shows was sponsored jointly by the Departments of Fisheries and Development. These two events provided an opportunity to specifically promote Nova Scotia fish products.

Resource Education Services

(a) Administrative Information and Control System

During the year the Department acquired a mini-computer system to improve the operational efficiency and responsiveness of administrative in-

formation and control systems and to provide scientific data processing capability. Software development is progressing and will be completed in the next fiscal period.

Systems to be automated include the grants and assistance administration system within the Industrial Development Division, the accounting system in the Fisheries Loan Board and the fishermen training statistical system. Word processing services and other data processing functions will be provided to all areas of the Department.

(b) Fisherman's Handbook

The first edition of the Fisherman's Handbook was distributed throughout the fishing industry during the year. This publication was widely accepted by fishermen who, for the first time, were able to get information on all provincial programs affecting the industry in one source book. Towards year end an updated version was nearing completion for publication early in the new year.

(c) Weatheradio Atlantic

Three new transmitter sites were activiated during the year in conjunction with the Atmospheric Environment Service, Environment Canada, to serve portions of Cape Breton Island with continuous weather information. These transmitters were located at Bear River in Prince Edward Island, Cape North and Sable Island. However, it was soon apparent that the mountainous terrain could not be overcome easily and even more transmitters would be necessary to provide the same level of service as on the mainland. By year end, further testing indicated that transmitters at Cheticamp and Ben Eoin would solve the problem. These two sites will be operational early in the new year.

(d) Exhibitions

The Department entered exhibits in the Nova Scotia Fisheries Exhibition and Fishermen's Reunion in Lunenburg and the Pictou Lobster Carnival. Planning was also completed for a booth at Fish Canada '82 which will be held in Halifax early in the new fiscal year.

STATISTICAL REVIEW

All fisheries production statistics given here for the calendar year 1981 are revised figures supplied through the courtesy of the federal Department of Fisheries and Oceans. They may be subject to minor adjustments as late returns from firms and individuals are received and processed in that Department.

NOVA SCOTIA FISHERIES MAJOR SPECIES LANDINGS OF THOSE SPECIES YIELDING OVER ONE MILLION DOLLARS ANNUALLY

(Listed in Descending Order of Value in 1981)

	Landings (Metric Tons)		Value (Thousand Dollars)	
	1981	1980	1981	1980
1. Scallops	79,960	65,348	88,336	63,736
2. Cod	128,249	116,652	53,942	42,732
3. Lobsters	7,891	6,472	41,314	33,770
4. Haddock	50,567	51,351	23,014	25,488
5. Herring	84,240	81,792	12,439	19,545
6. Pollock	38,299	33,746	10,237	8,395
7. Flounders	19,171	23,444	6,637	8,547
8. Shrimp	2,482	1,643	5,322	3,858
9. Redfish	20,529	16,340	4,106	3,360
10. Halibut	1,528	1,675	4,044	4,133
11. Cusk	5,958	4,548	2,568	1,532
12. Hake	8,886	8,656	2,418	2,196
13. Clams	2,149	2,166	1,514	1,436
14. Mackerel	6,612	7,267	1,485	1,674
15. Swordfish	572	1,886	1,256	4,170

Table I

Nova Scotia Fisheries
Landed and Marketed Value
1950 - 1981

(Value in thousand dollars)

Year	Landed Value	Marketed Value
1950	21,400	38,819
1955	23,582	47,093
1960	26,094	51,753
1965	49,371	93,443
1970	55,562	105,939
1975	91,010	208,574
1980	230,911	438,799
1981	263,727	501,081(1)

(1) This is an estimate based upon recent average past relationships between landed and marketed values.

Table II

Nova Scotia Fisheries
Landings and Landed Value by Species Group

	Landings (Metric Tons)		Value (Thousand Dollars)	
	1981	**1980**	**1981**	**1980**
Groundfish	277,879	261,669	108,457	97,866
Pelagic and Estuarial	94,498	95,876	16,480	27,579
Molluscs and Crustaceans	94,976	79,184	137,665	104,426
Miscellaneous (1)	11,965	10,806	1,107	1,034
Viscera, Sacles (2)	9	14	18	6
	479,327	447,549	263,727	230,911

(1) Seaweeds, worms.

(2) Livers, tongues, scales, roes, liver oil, skins.

Table III

Landed Value of Fisheries by Counties
(Value in thousand dollars)

County (1)	Landed Value (2) 1980	1981	Per Cent Change (3) 1980-81
Lunenburg	58,067	73,328	+ 26.3
Shelburne	36 311	38,385	+ 5.7
Digby	29,650	34,760	+ 17.2
Yarmouth	27,126	29,593	+ 9.1
Cape Breton	21,217	19,952	- 6.0
Guysborough	15,451	16,345	+ 5.8
Halifax	12,172	13,857	+ 13.8
Queens	10,048	13,282	+ 32.2
Inverness	6,245	7,237	+ 15.9
Victoria	3,983	4,754	+ 19.4
Richmond	3,557	3,482	- 2.1
Pictou	2,787	3,439	+ 23.4
Antigonish	1,909	2,449	+ 28.3
Annapolis	1,050	1,252	+ 19.2
Colchester	529	678	+ 28.2
Cumberland	427	691	+ 61.8
Kings	317	227	-28.4
Hants	65	16	-75.4
	230,911	263,727	+ 14.2

(1) Counties are in order of the 1980 landed value.

(2) Landed value includes groundfish, pelagic and estuarial, molluscs and crustaceans, viscera, seaweed and other.

(3) Increase (+); Decrease (-).

Table IV

Total Landed Weight of Fisheries by Counties
(Weight in Metric Tons)

County (1)	Landed Weight (2) 1980	1981	Per Cent Change (3) 1980-81
Lunenburg	101,965	117,320	+ 15.1
Cape Breton	58,954	51,634	-12.4
Shelburne	58,023	63,780	+ 9.9
Yarmouth	50,766	61,678	+ 21.5
Digby	45,826	48,633	+ 6.1
Guysborough	44,932	50,648	+ 12.7
Halifax	28,075	25,878	- 7.8
Queens	16,128	17,855	+ 10.7
Inverness	14,481	14,929	+ 3.1
Richmond	11,440	10,594	- 7.4
Victoria	6,986	7,075	+ 1.3
Pictou	3,807	3,948	+ 3.7
Antigonish	2,734	2,270	-17.0
Annapolis	1,716	1,683	- 1.9
Colchester	681	692	+ 1.6
Kings	430	238	-44.7
Cumberland	328	466	+ 42.1
Hants	277	6	-97.8
	447,549	479,327	+ 7.1

(1) Counties are in order of the 1980 landed weight.

(2) Landed weight includes groundfish, pelagic and estuarial, molluscs and crustaceans, viscera, seaweed and other.

(3) Increase (+); Decrease(-).

Table V

Landed Weight and Landed Value of Fisheries by Species Group by Counties (1980 - 1981)

County	Species Group (1)	Landed Weight (Metric Tons)		Landed Value ('000)	
		1980	1981	1980	1981
Annapolis	Groundfish	1,042	984	503	601
	Pelagic	64	92	17	26
	Shellfish	610	607	529	625
	Other	--	--	--	--
Antigonish	Groundfish	1,368	1,501	315	335
	Pelagic	250	214	163	207
	Shellfish	430	555	1,340	1,907
	Other	686	--	91	--
Cape Breton	Groundfish	40,871	45,674	13,123	15,451
	Pelagic	16,333	4,489	4,735	925
	Shellfish	1,750	1,470	3,359	3,574
	Other	--	1	--	2
Colchester	Groundfish	22	18	32	33
	Pelagic	79	25	59	17
	Shellfish	580	649	437	628
	Other	--	--	--	--
Cumberland	Groundfish	51	6	25	16
	Pelagic	166	253	94	127
	Shellfish	110	205	307	543
	Other	1	2	1	5
Digby	Groundfish	21,408	18,880	10,077	8,362
	Pelagic	8,449	8,944	1,799	981
	Shellfish	15,969	20,809	17,774	25,414
	Other	--	--	--	3
Guysborough	Groundfish	31,898	29,963	10,538	10,519
	Pelagic	11,909	19,193	2,929	2,680
	Shellfish	1,125	1,490	1,984	3,140
	Other	--	2	--	6

Table V Continued

County	Species Group (1)	Landed Weight (Metric Tons) 1980	1981	Landed Value ('000) 1980	1981
Halifax	Groundfish	24,185	21,339	8,685	9,572
	Pelagic	3,482	3,447	1,985	1,609
	Shellfish	408	1,089	1,502	2,669
	Other	--	3	--	7
Hants	Groundfish	14	--	10	--
	Pelagic	220	6	29	16
	Shellfish	43	--	26	--
	Other	--	--	--	--
Inverness	Groundfish	9,764	11,400	2,660	3,600
	Pelagic	2,527	1,604	592	285
	Shellfish	2,190	1,925	2,993	3,352
	Other	--	--	--	--
Kings	Groundfish	162	137	120	105
	Pelagic	257	90	116	46
	Shellfish	11	11	81	74
	Other	--	--	--	2
Lunenburg	Groundfish	58,505	64,864	18,006	18,463
	Pelagic	3,004	3,156	861	560
	Shellfish	40,456	49,300	39,200	54,305
	Other	--	--	--	--
Pictou	Groundfish	597	639	144	142
	Pelagic	1,990	1,530	919	308
	Shellfish	647	1,104	1,649	2,908
	Other	573	675	75	81
Queens	Groundfish	8,250	11,501	4,351	6,226
	Pelagic	3,495	599	1,013	105
	Shellfish	4,383	5,755	4,684	6,951
	Other	--	--	--	--

Table V Continued

County	Species Group (1)	Landed Weight (Metric Tons)		Landed Value ('000)	
		1980	1981	1980	1981
Richmond	Groundfish	10,108	9,908	3,056	2,968
	Pelagic	1,108	579	277	141
	Shellfish	224	107	224	373
	Other	--	--	--	--
Shelburne	Groundfish	41,978	46,906	20,961	25,865
	Pelagic	7,342	6,956	4,248	1,337
	Shellfish	1,907	2,429	10,624	10,748
	Other	6,796	7,489	478	435
Victoria	Groundfish	2,613	3,917	972	1,598
	Pelagic	3,113	2,188	897	658
	Shellfish	1,260	970	2,114	2,498
	Other	--	--	--	--
Yarmouth	Groundfish	8,833	10,242	4,286	4,605
	Pelagic	32,088	41,216	6,844	6,470
	Shellfish	7,081	6,418	15,608	17,934
	Other	2,764	3,802	388	583

(1) "Pelagic" includes pelagic and estuarial.
"Shellfish" includes molluscs and crustaceans.
"Other" includes livers, tongues, scales, roe and oil, sea plants, mammals, worms.

Table VI

Atlantic Provinces Landings and Landed Value - 1981

	Landed Weight (Metric Tons)	Landed Value ('000)
Nova Scotia	479,327	263,727
Newfoundland	485,725	158,303
New Brunswick	104,440	55,003
Prince Edward Island	55,524	31,786

Table VII

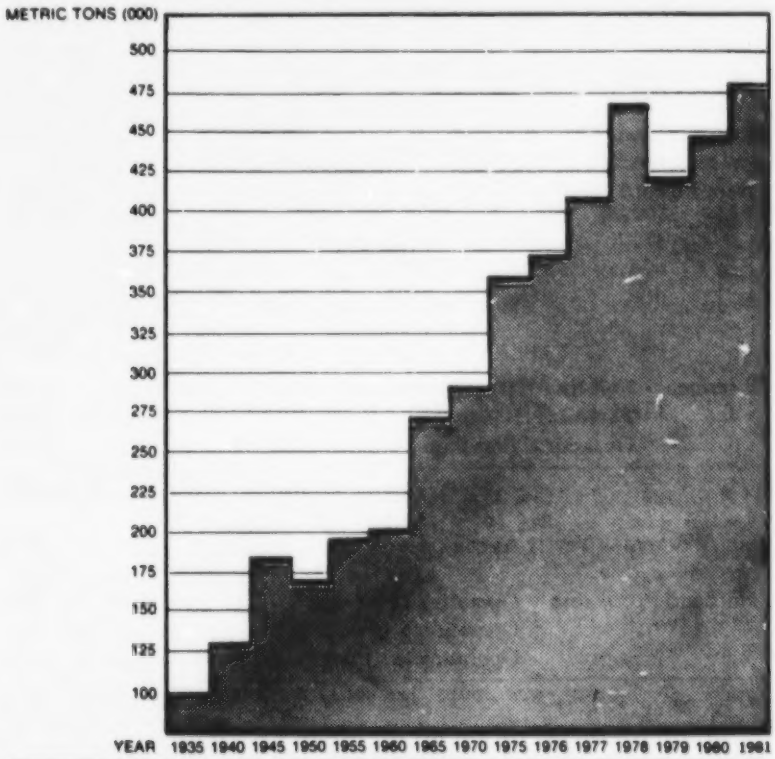
Nova Scotia Fishery Profile
Employment

Fishermen - Full-time (10 months or more - 1981)		6,506
Part-time (5-10 months - 1981)		1,593
Occasional (less than 5 months - 1981)		3,289
	TOTAL	11,388
Plant Workers - Yearly Average - 1981		7,973
Plants and Processors - Operating 12 months		109
Operating 5-10 months		70
Operating less than 5 months		7
	TOTAL	186

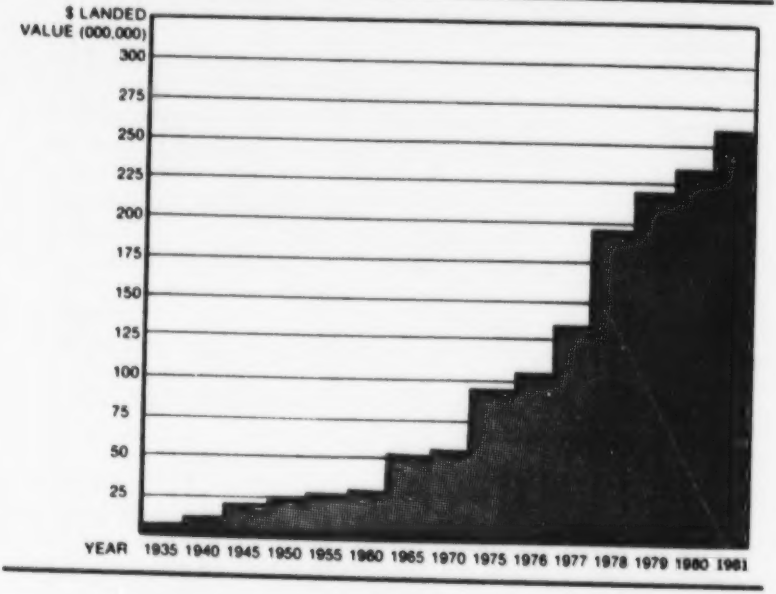
Fishing Craft

Tons	Number of Boats	Value ('000)
0 - 9.9	4,254	20,836
10 - 25.9	1,843	55,090
26 - 49.9	277	38,483
50 - 99.9	122	35,948
100 - 149.9	33	13,620
150 - 499.9	123	103,232
500 +	37	131,603
Total	6,689	398,812

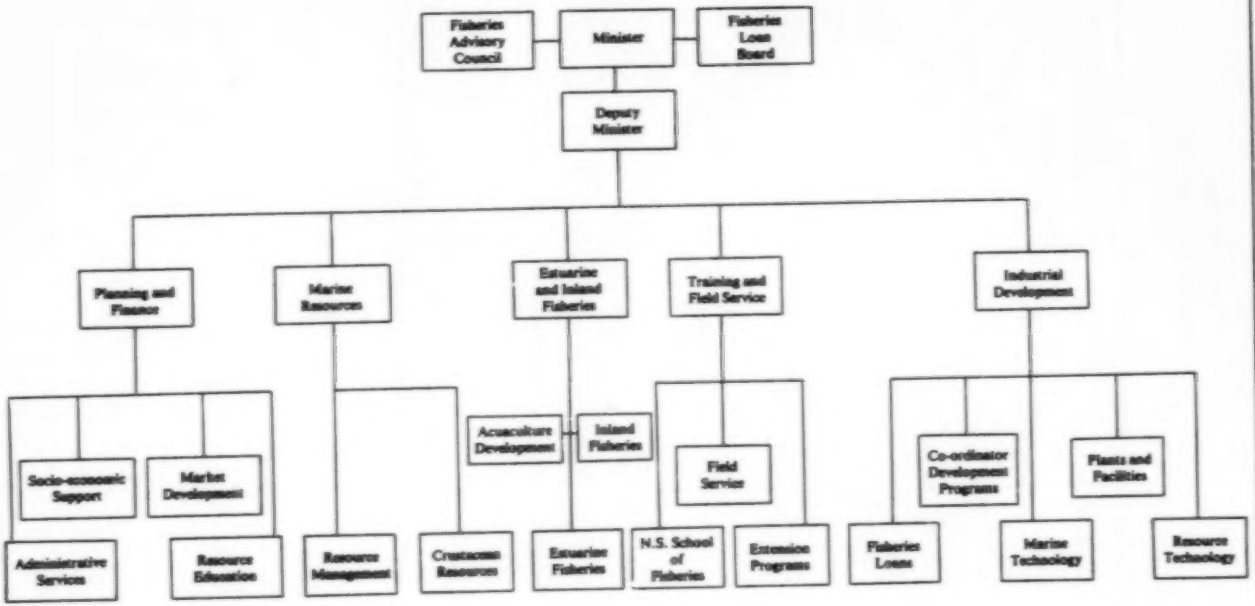
Nova Scotia
Landings Profile



Nova Scotia
Landed Value Profile



ORGANIZATION CHART
NOVA SCOTIA DEPARTMENT OF FISHERIES
January 10, 1983



Department of Fisheries
Telephone 424-4560 - Halifax
485-4525 - Pictou
485-5056 - Pictou

Minister	**Hon. Ken Streatch**	**Halifax**
Secretary to the Minister	Mrs. S.M. Grandy	Halifax
Deputy Minister	**D.A. MacLean**	**Halifax**
Secretary to the Deputy Minister	Miss M.L. Evans	Halifax
Planning and Finance Division		
Director	G.R. Richard	Halifax
Secretary to the Director	Ms. J.L. Ganner	Halifax
Supervisor, Socio-Economic Support	D.C. Thomas	Halifax
Market Development Officer	Ms. J.L. Raymond	Halifax
Seafood Consultant	Mrs. A.E. Bryant	Halifax
Public Information Officer	K.R. Weston	Halifax
Field Officer	G.E. Coles	Halifax
Supervisor, Administrative Services	C.G. Allen	Halifax
Personnel-Payroll Clerk	Mrs. D.A. Boudreau	Halifax
Accounting Clerk	P.J. Foran	Halifax
Accounting Clerk	Miss N.A. Smith	Halifax
Clerk Typist	Mrs. J.A. Pepper	Halifax
Clerk Receptionist	Miss S.J. Kane	Halifax
Equipment Officer	A.S. Munro	Pictou
Marine Resources Division		
Director	A.A. Longard	Halifax
Secretary to the Director	Mrs. M.N. Pepper	Halifax
Supervisor, Crustacean Resources	S.G. Roach	Halifax
Resource Management Analyst	B.D. Smith	Halifax
Estuarine and Inland Fisheries Division		
Director	L.L. MacLeod	Pictou
Secretary to the Director	VACANT	Pictou
Biologist	B.C. Muise	Ostrea Lake
Maintenance Worker	R.A. Truen	Ostrea Lake

Industrial Development Division

Director	J.A. Marsters	Halifax
Secretary to the Director	Mrs. M.E. Woolaver	Halifax
Co-ordinator, Development Programs	D.F. Hansen	Halifax
Incentive Programs Assistant	Mrs. M. E. Meagher	Halifax
Development Officer	R.C. MacLean	Halifax
Manager, Marine Technology	A.G. Boyden	Halifax
Supervisor, Vessels	VACANT	Halifax
Fisheries Technician	O.E. Egilsson	Pictou
Supervisor, Plants and Facilities	G.B. Scott	Halifax
Fisheries Technician	W.J. MacDonald	Halifax
Port Facilities Engineer	M.F. Giles	Halifax
Supervisor, Resource Technology	M.A. Drebot	Halifax

Nova Scotia Fisheries Loan Board

Executive-Director	J.A. Marsters	Halifax
Manager, Fisheries Loans	E.A. MacIntosh	Halifax
Secretary to the Manager	Mrs. N.L. Riles	Halifax
Secretary	Miss N.E. Corkum	Halifax
Chief Accountant	C.E. Decker	Halifax
Accounting and Insurance Clerk	Mrs. L.M. Fraser	Halifax
Accounting Clerk	Mrs. B.J. Tribble	Halifax
Loan Officer	J.P. Sarty	Halifax
Loan Officer	B.M. Allen	Halifax
Loan Officer	B.E. Cox	Halifax
Assistant Loan Officer	Mrs. L.M. Provender	Halifax
Technical Services Officer	M. Myketyn	Halifax
Fishing Vessel Inspector	B.G. Stockley	Halifax
Fishing Vessel Inspector	R.G. Wilkie	Pictou
Fishing Vessel Inspector	W.R. Buffett	Halifax
Fishing Vessel Inspector	T. Prewett	Halifax

Training and Field Services Division - Training

Director	J.J. McLevey	Halifax
Secretary to the Director	Mrs. B.J. O'Brien	Halifax

Supervisor, Fisheries Training Centre	D.F. Robertson	Pictou
Chief Clerk	Miss S.M. Bowron	Pictou
Instructor (Navigation)	L.M. Dube	Pictou
Instructor (Nets and Gear)	A.A. Kaiser	Pictou
Instructor (Navigation, Marine Emergency Duty)	D.B MacCallum	Pictou
Instructor (Engines)	G. Michor	Pictou
Instructor (Engines)	VACANT	Pictou
Instructor (Engines)	VACANT	Pictou
Instructor (Engines)	J.W. Grant	Pictou
Instructor (Business)	Miss B.J. Wright	Pictou
Training and Fishing Gear Co-ordinator	M.P. Picco	Pictou
Instructor (Navigation)	A.F. Tobey	Pictou
Maintenance Worker	E.G. Dalton	Pictou
Maintenance Worker	C. Steele	Pictou

Training and Field Service Division - Field Service

Supervisor, Field Service	C.F. MacKinnon	Halifax
Fisheries Representative	C.W. Rankin	Pictou
Fisheries Representative	L.A. Tobey	Port Hood
Fisheries Representative	A.P. Kehoe	Petit de Grat
Fisheries Representative	G.T. Boudreau	Little Dover
Fisheries Representative	E.J. Pellerin	Dartmouth
Fisheries Representative	G.C. Mossman	Rose Bay
Fisheries Representative	G.A. Nickerson	Clark's Harbour
Fisheries Representative	A.J. Muise	Middle West Pubnico
Fisheries Representative	R.K. McDormand	Granville Ferry

DEPARTMENT OF FISHERIES
Ordinary Expenditures

Fiscal Year Ending March 31	Total Ordinary Expenditure
1965	$ 230,787
1966	340,653
1967	321,742
1968	530,166
1969	412,577
1970	458,034
1971	1,020,778
1972	1,373,784
1973	908,457
1974	3,138,359 (1)
1975	1,088,534
1976	661,763
1977	2,350,456
1978	3,149,131
1979	5,377,213
1980	5,841,649
1981	11,047,135 (2)
1982	13,758,223

(1) More than $2 million was spent in the form of special assistance to help the industry recover from a storm in June 1973.

(2) This includes $5,009,667 in capital advance interest charges for the Fisheries Loan Board previously accounted for under Department of Finance Estimates. It is anticipated this procedure will continue, making a significant impact on the total ordinary expenditures.